CLAIMS

What is Claimed is:

1. A system for determine mean pulmonary arterial pressure of a patient, comprising:

a first sensor located in a ventricle of a heart to measure pressure;

a first circuit to measure electrocardiogram (EGM) signals; and

a processing circuit coupled to receive signals indicative of the pressure and the EGM signals, and to determine there from, mean pulmonary arterial pressure (MPAP).

2. The system of Claim 1, wherein the first circuit includes at least one electrode located within the cardiac vascular system of the patient.

3. The system of Claim 1, wherein the first circuit includes at least two electrodes placed on an external surface of the patient.

4. The system of Claim 1, wherein the first circuit is located within an implantable device, and wherein the first circuit includes at least one electrode positioned adjacent to a housing of the implantable device.

5. The system of Claim 1, wherein the first sensor is located within a first ventricle of the heart, wherein the system includes a second sensor located within the other ventricle of the heart, and wherein the processing circuit includes means to estimate the MPAP from pressure measured by both the first and second sensors.

6. The system of Claim 1, wherein the processing circuit is located within an implantable device.

7. The system of Claim 1, wherein the processing circuit is located in a device external to the patient, and wherein the system further includes a communication circuit to transfer indications of the measured pressure and the EGM signals to the processing circuit.

8. The system of Claim 1, wherein the processing circuit includes first and second portions, wherein the first portion is located within an implantable device, wherein the second portion is located within a device external to the patient, and wherein the system further includes a communication circuit to transfer data signals between the first and second portions.

9. The system of Claim 1, and further including a therapy delivery circuit coupled to the processing circuit to provide therapy to the patient.

10. The system of Claim 1, wherein the processing circuit includes means for controlling the therapy delivery circuit based on the estimated MPAP.

11. The system of Claim 10, wherein the therapy delivery circuit includes a circuit to provide cardiac resynchronization therapy to the patient.

12. The system of Claim 10, wherein the therapy delivery circuit includes a drug delivery device to deliver a biologically-active agent to the patient.

13. A method of determining mean pulmonary arterial pressure (MPAP), comprising:
a.) sensing pressure within a ventricle of a heart;
b.) sensing an electrocardiogram (EGM) signal of the heart; and
c.) using the sensed pressure and the EGM signal to derive the MPAP.

14. The method of Claim 13, wherein step c.) includes deriving a systolic time interval indicative of time spent by the heart in systole, and a diastolic time interval indicative of time spent in diastole.

15. The method of Claim 14, wherein step c.) includes deriving the systolic time interval by measuring from a start of an R-wave of the EGM signal to a time when a change in sensed pressure over time is at a maximum.

16. The method of Claim 15, wherein step c.) further includes utilizing the sensed pressure to determine a Ventricular Systolic Pressure (VSP), wherein the VSP is substantially a maximum pressure measured at any time during a cardiac cycle of the heart.

17. The method of Claim 16, wherein step c.) further includes utilizing the sensed pressure to determine an estimated Pulmonary Arterial Diastolic pressure (ePAD), wherein the ePAD is a pressure measured substantially at a time in the cardiac cycle wherein the change in the sensed pressure over time is at a maximum.

18. The method of Claim 17, and further including:

c.) multiplying the diastolic time interval by the ePAD;

d.) multiplying the systolic time interval by the VSP; and

e.) adding the values obtained in steps c.) and d.) to obtain the MPAP.

19. The method of Claim 13, and further comprising delivering therapy based on the MPAP.

20. The method of Claim 19, and further comprising delivering a biologically-active agent to the patient based on the MPAP.

21. The method of Claim 19, and further comprising delivering cardiac resynchronization therapy to the patient based on the MPAP.

22. The method of Claim 21, and further comprising modifying timing parameters of the cardiac resynchronization therapy based on the MPAP.

23. A system for deriving mean pulmonary arterial pressure (MPAP) of a patient, comprising:

pressure sensing means located in a ventricle of a heart for measuring pressure;

EGM sensing means for sensing an electrocardiogram (EGM) signal; and

processing means for deriving the (MPAP) based on the measured pressure and the EGM signal.

24. The system of Claim 23, wherein the EGM sensing means includes means located within a chamber of a heart for sensing the EGM signal.

25. The system of Claim 23, wherein the EGM sensing means includes means external to the patient for sensing the EGM signal.

26. The system of Claim 23, wherein the EGM sensing means includes means located subcutaneously on the patient for sensing the EGM signal.

27. The system of Claim 23, wherein the processing means include means implanted within the patient.

28. The system of Claim 23, wherein the processing means includes means external to the patient.

29. The system of Claim 23, wherein the processing means includes means implanted within the patient and means external to the patient.

30. The system of Claim 23, and further including therapy delivery means for delivering therapy to a patient based on the MPAP.